Paying bills*

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Abstract

paying bills

1. Pitch

This paper looks at whether utilities in developing countries provide an important source of credit to households by letting them not pay their bill? And how do these benefits compare to the costs of delinquency?

Motivation : (1) around the world, there are restrictions on when utilities can disconnect people (health, low-income, elderly), motivated by providing a sense of insurance; (2) Also, in developing countries, pre-paid metering where utilities essentially put fancy meters that only distribute water when people pay first. these shut off any credit channel but eliminate delinquency

Context : In Manila, water bills make up about 3% of income on average, jumps to 5 to 10% for low-income folks. I have data from a large water provider serving half the city of Manila. On average, people make a payment in three out of four months and are about a month behind in payments. For example, if you don't pay for three months, that's like taking a three-month loan of around 9% of your income.

People might be paying infrequently because they are credit-constrained and consumption smoothing; or it might just be a pain to pay their bills so they just avoid the hassle by paying infrequently (and they have plenty of other opportunities to smooth).

I use disconnection threats to better isolate the role of credit constraints. Workers will occasionally visit delinquent customers and say if you don't pay your bill soon (within 12 days on average), we'll disconnect you. Only 23% of people say that's "enough time" to pay the bill. After the threats, payments spike to double the average bill, delinquency drops to zero, and consumption drops by around 25%. If it were simply a hassle, people would pay their bill and consumption wouldn't change (they could get easy credit from other places and pay the bill); but if they are credit constrained, they have to deviate from consumption smoothing to make the payments. The next step is to use theory to see what this decrease in consumption implies about the short-term interest rate that households face.

2. Introduction

2.1. Question

Are utilities providing an important source of credit to households by letting them not pay their bill?

2.2. Motivation

- Disconnection policies as insurance (in the US)
    - weather, health, low-income
    - mandate that utilities amortize arrears
    - Utilities even tolerate greater non-payment

- At the same time, pre-paid metering is growing like crazy in the developing world (Sources)

2.3. Descriptives

- Avg Income: 22,000 PhP (488 USD) [Bill 3%]

- Avg Savings: 4,300 PhP (96 USD)

- 20% Income: 8,300 PhP (184 USD) [Bill 7.6%]

- 20% Savings: 330 PhP (7 USD)

- Avg Bill: 630 PhP (14 USD)

- Make payments 75% of months

- Avg delinquency: 30 days

- Avg Payment Amount: 830 PhP (18 USD)

But : might just be inconvenient to pay every month (but its really easy to pay bills in this context)

How can I ballpark this against the consumption smoothing literature?

2.4. Approach

Disconnection : Don't pay bill; come and threaten disconnection

- avg days to pay : 12 days (only 23% say that's enough time)

- if you (agree to?) pay, you are reconnected after 2 days

- 30% of connections are threatened with disconnection

- (small percent actually disconnect)

- Pay (+1) 800 PhP (+2) 300 PhP = total 1100 PhP (24 USD) [about two water bills on average]

- Consumption drops by about 20% for two months (there is a pre-trend which can be interpreted as positive demand shocks)

Theory :

- suddenly this source of credit is cut off (loan with uncertain payback date)

- concave utility predicts that households would want to smooth consumption (could get another loan, then fund consumption in that period)

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3. Paying Water Bills in Manila

At the end of each month, the water company sends meter readers who record monthly consumption for each account and then use a mobile device to print and deliver the bill to the account owner in person.[1] The account owner is then expected to pay the bill by the end of the month. Account owners have many options to pay their bills with 84.9% of accounts reporting using small payment centers (mall kiosks, gas stations, convenient stores, etc.), 9.4% paying at local water company offices, 5.5% paying over phone, online, or via ATM kiosks, and 0.2% paying the meter readers in person.[2]

After an account has remained unpaid for a minimum of 60 days, the government regulator allows the water company to issue a written statement to the account owner, notifying the owner that their water will be disconnected in 7 days if their outstanding balances remain unpaid. The government regulator also prohibits the water company from charging any interest on these outstanding balances. In practice, the water company tolerates 108.1 days of delinquency on average before issuing a notice. The level of delinquency tolerated before issuing notices also appears uncorrelated with (list measures/demographics...). (SHOW REGRESSION IN APPENDIX)

Upon receiving a notice of disconnection, account owners negotiate for time to pay their outstanding balances. In 96.1% of notices, owners are required to pay within 30 days, making an average grace period of 12.4 days according to the water account survey. The administrative data indicate that .7% of notices are paid within three months of receiving the notice.[3]

Disconnection typically involves workers from the water company placing a metal lock on the water meter stopping the flow. Once disconnected, account owners are charged a one-time fee of 200 PhP to restore their water service on top of settling any outstanding balances. The water company is then required to restore service within 48 hours of receiving full payment for reconnection.

In some cases

the water company is allowed to disconnect an account only after it has remained unpaid for over 60 days and the water company has issued a written statement to the account .

4. Interest rate

Karlan and Zinman [2009] find money lenders regularly charge at least 20% per month for credit. Giné and Karlan [2014] offer small monthly loans of 1,000 PhP at 2.5% monthly interest.

Andreoni and Sprenger [2012] estimate rates between 25% and 35% in an experimental setting and confirm exponential discounting. Laibson et al. [2007] use a similar

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[1]The company upgraded in the first year of the sample. Previously, the company mailed the bill to each account at the end of the month.
[2]Figures are tabulated from the account survey.
[3]how this is actually calculated please!!

Table 1. Estimates

	Estimate	Standard Error
Interest Rate	0.046	0.00
Income Variance	0.300	0.00
Water Preference	0.020	0.00

Table 2. Fit

	Data	Estimated
Mean Usage (m3)	24.9	25.5
SD Usage	11.1	2.2
Mean Water Debt (PhP)	1232	1222
SD Water Debt (PhP)	1281	1821
Corr. Usage and Water Debt	0.34	-0.01
Mean Usage Pre-Collect (m3)	26.2	25.2
Mean Usage Post-Collect	23.4	22.7
Diff. (Pre-Post) (m3)	2.8	2.5

consumption-savings structural approach and recover a discount rate of around 15%. Gourinchas and Parker [2002] use a similar structural approach finding a lower discount rate of around 5%.

5. Results

References

J. Andreoni and C. Sprenger. Estimating time preferences from convex budgets. *American Economic Review*, 102(7):3333–56, 2012.

X. Giné and D. S. Karlan. Group versus individual liability: Short and long term evidence from philippine microcredit lending groups. *Journal of development Economics*, 107:65–83, 2014.

Table 3. Counterfactuals

	Current	No Water Credit	No Water Credit and Revenue Neutral
Water Credit Interest Rate	0.0	1.0	1.0
Mean Usage (m3)	25.5	24.2	26.1
Compensating Variation		51.6	1.4
Delinquency Savings	20.8	20.8	0.0
Price Intercept	16.3	16.3	13.5

Figure 1. Simulated Months
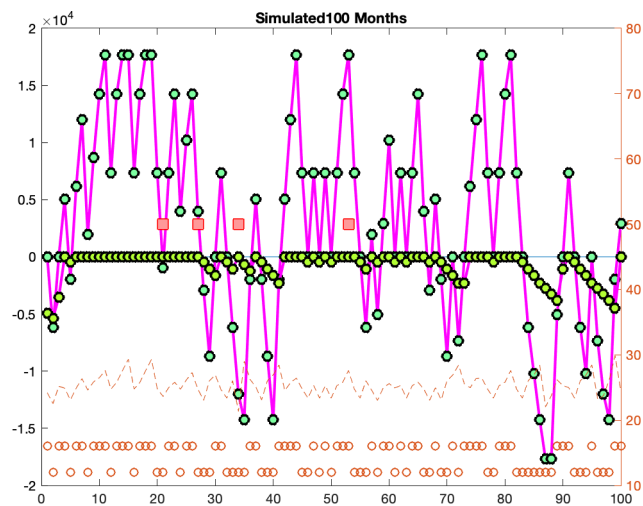
P.-O. Gourinchas and J. A. Parker. Consumption over the life cycle. *Econometrica*, 70 (1):47–89, 2002.

D. S. Karlan and J. Zinman. Expanding microenterprise credit access: Using randomized supply decisions to estimate the impacts in manila. 2009.

D. Laibson, A. Repetto, and J. Tobacman. Estimating discount functions with consumption choices over the lifecycle. Technical report, National Bureau of Economic Research, 2007.